

BEST AVAILABLE COPY

Application No. 10/699,278
Response to Office Action

Customer No. 01933

Listing of Claims:

1. (Currently Amended) A suspension apparatus of a multi-axle vehicle having at least three tire axles, comprising:

i) a front link ~~of which~~ including an upper end portion ~~is~~ connected to a vehicle body with a pin, and ~~of which~~ a lower end portion ~~is~~ in a vicinity of a front axle,

ii) a rear link ~~of which~~ including an upper end portion ~~is~~ connected to said vehicle body with a pin, and ~~of which~~ a lower end portion ~~is~~ in a vicinity of a rear axle adjacent to said front axle, and

iii) a connecting link for longitudinally connecting portions in vicinities of the respective lower end portions of said front link and said rear link so as to pair said front axle and said rear axle, ~~which are placed in vicinities of at least a pair of said front axle and said rear axle, with an optional adjacent front axle and rear axle being paired~~, and

wherein at least one quadric link structure formed by said vehicle body, said front link, said rear link and said connecting link form a quadric link structure, and said suspension apparatus comprises at least one said quadric link structure; and

~~wherein said front axle is mounted to a vicinity of a front joint at a lower side of at least said one quadric link structure~~

Application No. 10/699,278
Response to Office Action

Customer No. 01933

and ~~said rear axle is mounted to a vicinity of a rear joint at the lower side of at least said one quadric link structure, and wherein in at least said one quadric link structure, a side length at a side of said connecting link is shorter than a side length at a side of said vehicle body.~~

25 Claims 2 and 3 (Canceled).

4. (Currently Amended) A suspension apparatus of a multi-axle vehicle having at least four tire axles, comprising:

i) a plurality of front links, each of which includes an upper end portion connected to a vehicle body with pins, and of which a lower end portion portions are in 5 a vicinities vicinity of a respective front axles axle,

ii) a plurality of rear links, each of which includes an upper end portion connected to said vehicle body with pins, and of which a lower end portion portions are in 10 a vicinities vicinity of a respective rear axles axle, and

iii) a plurality of connecting links, each of which for longitudinally connecting connects portions in vicinities of the respective lower end portions of a respective one of said front links and a respective one of said rear links [[,] so as to pair 15 which are placed in vicinities of said respective front axles and said respective rear axles of at least two pairs of said axles.

Application No. 10/699,278
Response to Office Action

Customer No. 01933

including such that said at least four axles form a pair at a forefront of the vehicle and a pair at a rear end of the vehicle, with a first axle and a second axle from a front of the vehicle 20 being made forming the pair at the forefront, and a second axle and a first axle from a rear of said vehicle being made forming the pair at the rear end; and

wherein a plurality of quadric link structures are each formed by said vehicle body, said a respective front links link, 25 said a respective rear links link and said a respective connecting links link, and

wherein said respective front axles are mounted to vicinities of front joints at lower sides of said respective quadric link structures and said respective rear axles are 30 mounted to vicinities of rear joints at the lower sides of said respective quadric link structures; and

wherein in said respective quadric link structures, respective side lengths at sides of said connecting links are shorter than respective side lengths at sides of said vehicle 35 body.

5. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to Claim 4, wherein a number of said at least four tire axles is comprise at least six tire axles; and

Application No. 10/699,278
Response to Office Action

Customer No. 01933

5 wherein at least one pair with of an optional adjacent front axle and rear axle being paired is formed in a middle portion of said vehicle between said pair at the forefront and said pair at the rear end.

6. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 1, wherein ~~at least one of~~ said connecting ~~links~~ link is adjustable in length.

7. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 1, wherein ~~at least one of~~ said connecting ~~links~~ link comprises a suspension link ~~extending~~ which extends and ~~contracting~~ contracts in length in accordance 5 with a load.

8. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 1, wherein one of a hydraulic cylinder ~~or~~ and a suspension cylinder for controlling an attitude of said quadric link structure is ~~placed in~~ provided 5 at least one of spot between said vehicle body and said front link and between said vehicle body and said rear link.

9. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to Claim 6, wherein one of a

Application No. 10/699,278
Response to Office Action

Customer No. 01933

hydraulic cylinder or and a suspension cylinder for controlling an attitude of said quadric link structure is placed in provided 5 at least one of spot between said vehicle body and said front link and between said vehicle body and said rear link.

10. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to Claim 7, wherein one of a hydraulic cylinder or and a suspension cylinder for controlling an attitude of said quadric link structure is placed in provided 5 at least one of spot between said vehicle body and said front link and between said vehicle body and said rear link.

11. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 1, further comprising:

a suspension cylinder which is placed in at least one spot provided between said vehicle body and said front link, and which 5 controls rotation of said front link; and

a suspension cylinder which is placed in at least one spot provided between said vehicle body and said rear link, and which controls rotation of said rear link,

wherein a length of said connecting link is selected to be 10 one of a locked or controlled state, and a freely opened state are selectable for length of said connecting link.

Application No. 10/699,278
Response to Office Action

Customer No. 01933

12. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 1, further comprising [:] one of a crawler belt or and a chain which is ~~mounted by being~~ wound around respective tired wheels of at least one of said pair 5 of said front axle and said rear axle which ~~are~~ paired.

Claims 13-16 (Canceled).

17. (Previously Presented) The suspension apparatus of the multi-axle vehicle according to claim 4, wherein at least one of said connecting links is adjustable in length.

18. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to Claim 17, wherein one of a hydraulic cylinder or and a suspension cylinder for controlling an attitude of at least one of said quadric link structure 5 structures is placed in provided at least one of spot between said vehicle body and a respective one of said front link links and between said vehicle body and a respective one of said rear link links.

19. (Previously Presented) The suspension apparatus of the multi-axle vehicle according to claim 5, wherein at least one of said connecting links is adjustable in length.

Application No. 10/699,278
Response to Office Action

Customer No. 01933

20. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 19, wherein one of a hydraulic cylinder or and a suspension cylinder for controlling an attitude of at least one of said quadric link structure structures is placed in provided at least one of spot between said vehicle body and a respective one of said front link links and between said vehicle body and a respective one of said rear link links.
5

Claims 21-24 (Canceled).

25. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 4, wherein at least one of said connecting links comprises a suspension link extending which extends and contracting contracts in length in accordance with a load.
5

26. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 25, wherein one of a hydraulic cylinder or and a suspension cylinder for controlling an attitude of at least one of said quadric link structure structures is placed in provided at least one of spot between said vehicle body and a respective one of said front link links
5

Application No. 10/699,278
Response to Office Action

Customer No. 01933

links and between said vehicle body and a respective one of said rear link links.

27. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 5, wherein at least one of said connecting links comprises a suspension link extending which extends and contracting contracts in length in accordance with a 5 load.

28. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 27, wherein one of a hydraulic cylinder or and a suspension cylinder for controlling an attitude of at least one of said quadric link structure structures is placed in provided at least one of spot between said vehicle body and a respective one of said front link links and between said vehicle body and a respective one of said rear link links. 5

Claims 29 and 30 (Canceled).

31. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 4, wherein one of a hydraulic cylinder or and a suspension cylinder for controlling an attitude of at least one of said quadric link structure

Application No. 10/699,278
Response to Office Action

Customer No. 01933

5 structures is placed in provided at least one of spot between said vehicle body and a respective one of said front link links and between said vehicle body and a respective one of said rear link links.

32. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 5, wherein one of a hydraulic cylinder or and a suspension cylinder for controlling an attitude of at least one of said quadric link structure

5 structures is placed in provided at least one of spot between said vehicle body and a respective one of said front link links and between said vehicle body and a respective one of said rear link links.

Claims 33 and 34 (Canceled).

35. (Currently Amended) The suspension apparatus of the multi-axle vehicle according to claim 4, further comprising:

5 a suspension cylinder which is placed in at least one spot provided between said vehicle body and a respective one of said front link links, and which controls rotation of said respective front link; and

a suspension cylinder which is placed in at least one spot provided between said vehicle body and a respective one of

Application No. 10/699,278
Response to Office Action

Customer No. 01933

10 said rear link links, and which controls rotation of said
respective rear link,

wherein a length of said connecting links is selected to be
one of a locked or controlled state, and a freely opened state
are selectable for length of said connecting link.

36. (Currently Amended) The suspension apparatus of the
multi-axle vehicle according to claim 5, further comprising:

5 a suspension cylinder which is placed in at least one spot
provided between said vehicle body and a respective one of
said front link links, and which controls rotation of said
respective front link; and

10 a suspension cylinder which is placed in at least one spot
provided between said vehicle body and a respective one of
said rear link links, and which controls rotation of said
respective rear link,

wherein a length of said connecting links is selected to be
one of a locked or controlled state, and a freely opened state
are selectable for length of said connecting link.

Claims 37 and 38 (Canceled).

39. (Currently Amended) The suspension apparatus of the
multi-axle vehicle according to claim 4, further comprising [:]

Application No. 10/699,278
Response to Office Action

Customer No. 01933

one of a crawler belt or and a chain which is ~~mounted by being~~
wound around respective tired wheels of at least one said pair of
5 said front axle and said rear axle ~~which are paired~~.

40. (Currently Amended) The suspension apparatus of the
multi-axle vehicle according to claim 5, further comprising [:]
one of a crawler belt or and a chain which is ~~mounted by being~~
wound around respective tired wheels of at least one said pair of
5 said front axle and said rear axle ~~which are paired~~.

41. (New) The suspension apparatus of the multi-axle
vehicle according to claim 1, wherein said front axle is mounted
to a vicinity of a front joint at a lower side of said quadric
link structure and said rear axle is mounted to a vicinity of a
5 rear joint at the lower side of said quadric link structure.

42. (New) The suspension apparatus of the multi-axle vehicle
according to claim 41, wherein said connecting link is adjustable
in length.

43. (New) The suspension apparatus of the multi-axle
vehicle according to Claim 42, wherein one of a hydraulic
cylinder and a suspension cylinder for controlling an attitude of
said quadric link structure is provided at least one of between

Application No. 10/699,278
Response to Office Action

Customer No. 01933

5 said vehicle body and said front link and between said vehicle body and said rear link.

44. (New) The suspension apparatus of the multi-axle vehicle according to claim 41, wherein said connecting link comprises a suspension link which extends and contracts in length in accordance with a load.

45. (New) The suspension apparatus of the multi-axle vehicle according to Claim 44, wherein one of a hydraulic cylinder and a suspension cylinder for controlling an attitude of said quadric link structure is provided at least one of between 5 said vehicle body and said front link and between said vehicle body and said rear link.

46. (New) The suspension apparatus of the multi-axle vehicle according to claim 41, wherein one of a hydraulic cylinder and a suspension cylinder for controlling an attitude of said quadric link structure is provided at least one of between said vehicle body and said front link and between said vehicle body and said rear link.

47. (New) The suspension apparatus of the multi-axle vehicle according to claim 41, further comprising:

Application No. 10/699,278
Response to Office Action

Customer No. 01933

5 a suspension cylinder which is provided between said vehicle body and said front link, and which controls rotation of said front link; and

a suspension cylinder which is provided between said vehicle body and said rear link, and which controls rotation of said rear link,

10 wherein a length of said connecting link is selected to be one of a locked or controlled state, and a freely opened state.

48. (New) The suspension apparatus of the multi-axle vehicle according to claim 41, further comprising one of a crawler belt and a chain which is wound around respective tired wheels of at least one said pair of said front axle and said rear axle.

49. (New) The suspension apparatus of the multi-axle vehicle according to claim 4, wherein said respective front axles are mounted to vicinities of front joints at lower sides of respective quadric link structures and said respective rear axles 5 are mounted to vicinities of rear joints at the lower sides of said respective quadric link structures.

50. (New) The suspension apparatus of the multi-axle vehicle according to Claim 49, wherein said at least four tire axles comprise at least six tire axles; and

Application No. 10/699,278
Response to Office Action

Customer No. 01933

wherein at least one pair of an adjacent front axle and rear
5 axle is formed in a middle portion of said vehicle between said
pair at the forefront and said pair at the rear end.

51. (New) The suspension apparatus of the multi-axle
vehicle according to claim 50, wherein at least one of said
connecting links is adjustable in length.

52. (New) The suspension apparatus of the multi-axle
vehicle according to claim 51, wherein one of a hydraulic
cylinder and a suspension cylinder for controlling an attitude of
at least one of said quadric link structures is provided at least
one of between said vehicle body and a respective one of said
front links and between said vehicle body and a respective one
of said rear links.

53. (New) The suspension apparatus of the multi-axle
vehicle according to claim 50, wherein at least one of said
connecting links comprises a suspension link which extends and
contracts in length in accordance with a load.

54. (New) The suspension apparatus of the multi-axle
vehicle according to claim 53, wherein one of a hydraulic
cylinder and a suspension cylinder for controlling an attitude of

Application No. 10/699,278
Response to Office Action

Customer No. 01933

5 at least one of said quadric link structures is provided at least
one of between said vehicle body and a respective one of said
front links and between said vehicle body and a respective one
of said rear links.

55. (New) The suspension apparatus of the multi-axle
vehicle according to claim 50, wherein one of a hydraulic
cylinder and a suspension cylinder for controlling an attitude of
at least one of said quadric link structures is provided at least
5 one of between said vehicle body and a respective one of said
front links and between said vehicle body and a respective one
of said rear links.

56. (New) The suspension apparatus of the multi-axle
vehicle according to claim 50, further comprising:

5 a suspension cylinder which is provided between said vehicle
body and a respective one of said front links, and which controls
rotation of said respective front link; and

a suspension cylinder which is provided between said vehicle
body and a respective one of said rear links, and which controls
rotation of said respective rear link,

10 wherein a length of said connecting links is selected to be
one of a locked or controlled state, and a freely opened state.

Application No. 10/699,278
Response to Office Action

Customer No. 01933

57. (New) The suspension apparatus of the multi-axle vehicle according to claim 50, further comprising one of a crawler belt and a chain which is wound around respective tired wheels of at least one said pair of said front axle and said rear
5 axle.

58. (New) The suspension apparatus of the multi-axle vehicle according to claim 49, wherein at least one of said connecting links is adjustable in length.

59. (New) The suspension apparatus of the multi-axle vehicle according to Claim 58, wherein one of a hydraulic cylinder and a suspension cylinder for controlling an attitude of at least one of said quadric link structures is provided at least
5 one of between said vehicle body and a respective one of said front links and between said vehicle body and a respective one of said rear links.

60. (New) The suspension apparatus of the multi-axle vehicle according to claim 49, wherein at least one of said connecting links comprises a suspension link which extends and contracts in length in accordance with a load.

Application No. 10/699,278
Response to Office Action

Customer No. 01933

61. (New) The suspension apparatus of the multi-axle vehicle according to claim 60, wherein one of a hydraulic cylinder and a suspension cylinder for controlling an attitude of at least one of said quadric link structures is provided at least 5 one of between said vehicle body and a respective one of said front links and between said vehicle body and a respective one of said rear links.

62. (New) The suspension apparatus of the multi-axle vehicle according to claim 49, wherein one of a hydraulic cylinder and a suspension cylinder for controlling an attitude of at least one of said quadric link structures is provided at least 5 one of between said vehicle body and a respective one of said front links and between said vehicle body and a respective one of said rear links.

63. (New) The suspension apparatus of the multi-axle vehicle according to claim 49, further comprising:

a suspension cylinder which is provided between said vehicle body and a respective one of said front links, and which controls 5 rotation of said respective front link; and

Application No. 10/699,278
Response to Office Action

Customer No. 01933

a suspension cylinder which is provided between said vehicle body and a respective one of said rear links, and which controls rotation of said respective rear link,

wherein a length of said connecting links is selected to be
10. one of a locked or controlled state, and a freely opened state.

64. (New) The suspension apparatus of the multi-axle vehicle according to claim 4, further comprising one of a crawler belt and a chain which is wound around respective tired wheels of at least one said pair of said front axle and said rear axle.

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.